

Claims

1. A well jet device comprising, all of them being arranged on a tubing string, a packer, a jet pump, in the body of which an active nozzle and a mixing chamber with a diffuser are arranged as well as a stepped through channel is made, and a sealing unit with an axial channel is arranged in the stepped through channel, a flexible tube with a logging device for measuring physical quantities, e.g., a specific resistance of rocks, being arranged on the lower end thereof, and the jet pump being arranged over the producing formations in a well at a distance h , being equal to:

$$h \geq \frac{P_f - \Delta P}{g\sigma},$$

and being made with the following dimensional relations: the relation of the diameter D_{cc} of the mixing chamber cross-section to the diameter D_c of the nozzle output cross-section is from 1.1 to 2.4; the relation of the mixing chamber length L_c to the diameter D_{cc} of the mixing chamber cross-section is from 3 to 7; the relation of the nozzle length L_n to the diameter D_c of its output cross-section is from 1 to 8; the distance L from the nozzle output cross-section to the mixing chamber input cross-section is from 0.3 to 2 diameters D_c of the nozzle output cross-section; and the angle α between the diffuser generatrix and the diffuser longitudinal axis is from 4° to 14° ,

where:

h is the vertical component of the distance between the jet pump and the bottom of the production formations, in meters;

P_f is the formation pressure, in N/m^2 ;

ΔP is the maximum allowable value of depression on a production formation, in N/m^2 ;

g is the acceleration of gravity, in m/s^2 ;

σ is the fluid density in a well, in kg/m^3 .

2. The well jet device according to Claim 1, characterized in that the flexible tube at its lower end has holes in its wall.

3. The well jet device according to Claim 1, characterized in that the outer diameter D_{ft} of the flexible tube relates to the outer diameter D_s of the sealing unit as $D_{ft} \leq (0.3-0.7) D_s$.

4. A method of operating of the well jet device consisting in that a jet pump with a through channel made in its body and a packer with a through channel, as arranged below the jet pump, are lowered into a well on a tubing string; at the given depth the packer is released, the latter being arranged over the production formations under study; then a logging device, as arranged on the lower end of the flexible tube, is lowered on the flexible tube with the perforated lower section along the tubing string and arranged in the area of the production formations, and in the lowering process a sealing unit being arranged in the through channel of the jet pump, and background values of the physical parameters of production formations in the borehole area are registered with the use of the logging device, after that an operating fluid is fed into the nozzle of the jet pump, thus creating a series of different value depressions in the under-packer space, measuring the well flow rate at each depression value, then the physical parameters of the formation fluid, which is coming into the well, and those of production formations are measured by moving the logging device on the flexible tube along the formations, after completing measurements, the logging device is raised on the surface, the packer is released, and the tubing string together with the jet pump and the packer is extracted.

5. The method of operation according to Claim 4, characterized in that an additional study of production formations is carried out, for which purpose a liquid having anomalous physical properties, e.g., abnormally high section of thermal capture, is pumped into a well over the flexible tube through its lower perforated section, or the near-borehole area in the production formations is chemically treated by pressuring chemical agents into the production formations after which the production formations are studied.

6. The method of operation according to Claim 4, characterized in that studies with the use of the logging device may be carried out when the jet pump is in operation or is stopped.